

Amendments to the Specification:

Please add the following new paragraphs after paragraph [0060]:

[0060.1] Figs. 21A-21B demonstrate treating a PFO using a closure device having a backstop according to an embodiment of the present invention.

[0060.2] Figs. 22A-22D demonstrate treating a PFO using a spring coil closure device according to an embodiment of the present invention.

[0060.3] Fig. 23 demonstrates treating a PFO using a spring coil closure device according to another embodiment of the present invention.

[0060.4] Fig. 24 demonstrates treating a PFO using a spring coil closure device according to another embodiment of the present invention.

Please add the following new paragraphs after paragraph [0091]:

[0091.1] Referring to FIG. 21A, one embodiment of a backstop catheter device 800 for treating a PFO may include an outer catheter element 802, an inner catheter element 804, a backstop 806 coupled with a portion 808 extending through the inner shaft 804, and energy delivery arms 810. Energy delivery arms 810 can include ultrasound transducers, microwave antennae, or RF electrodes. The backstop catheter device 800 is advanced through the PFO and used to help advance an energy delivery catheter to the right atrial side of the PFO. Relative translation of an inner 804 and outer catheter element 802 deploy a set of arms 810 which carry the energy delivery elements. The energy delivered breaks down the collagen in each part of the PFO, and allows the tissues to be welded together. The energy delivered could take the form of RF, microwave, or ultrasound. RF energy can either be monopolar, in which the backstop 806 is electrically insulated such that it is not part of the energy delivery path, or bipolar, in which case the backstop 806 acts as the energy return electrode. If desired, the inner catheter 804 of the energy delivery catheter 800 can be used to infuse liquid albumin to act as a protein solder for

the system. Alternatively, the shaft of the backstop 806 could be covered with a tube of solid or braided material made of, or soaked in, a tissue solder. After delivery of the energy and activation and bonding of the tissue solder to the PFO walls, the backstop 806 is withdrawn through the PFO and the entire system is withdrawn.

[0091.2] As illustrated in FIG. 21B, in another embodiment, a catheter device 820 can include an expandable balloon member 822 and an expandable backstop 824. The balloon catheter 820 can be outfitted with sections 826 of piezo film/foil which can be driven electrically to produce an ultrasound signal to heat and seal a PFO. The balloon member 822 and expandable backstop 824 are used to position the catheter device 820 in the desired location and energy is then applied via the piezo film/foil 826 for treating the PFO.

[0091.3] In other embodiments, PFO closure systems according to the present invention may utilize one or more clips to close the PFO. Such systems can be divided into designs that involve both a right and left atrial component, and those that are right-sided only. While they are generally not energized, it may be desirable to add energy to any of these designs to facilitate adhesion and sealing.

[0091.4] Referring now to FIG. 22A through FIG. 22D, another embodiment of the present invention is described which includes a catheter device 832 comprising a coil closure device 830. According to this embodiment, a catheter 832 is used to insert a closure device 830 comprising a pair of flexible, pre-formed coils 834, 836 into both the left and right atriums. The spring tension in the pair of coils 834, 836 pulls the primum into the secundum to close the PFO.

[0091.5] Referring now to FIG. 23, another embodiment of the present invention includes a deployable spring coil closure device 840 which may be inserted through a small pierced hole in the septum. For example, a needle tipped catheter (not shown) can be used to pierce the primum and install the spiral spring coil 840 (e.g., similar to that described above) through a small hole made in the septum rather than through the PFO tunnel itself.

[0091.6] Referring now to FIG. 24, in another embodiment, a spiral spring coil 850 is inserted through the PFO. The portion 852 of the wire form that goes through the actual PFO tunnel is

shaped to maximize contact area and flatten the PFO by stretching it closed. RF energy is then applied to the wire 850 to burn it into the tissue and promote tissue growth, especially in the area between the primum and secundum where there is a high contact area. The flattened PFO combined with tissue healing on adjacent primum and secundum sides might cause the PFO to heal closed. The spring tension provided by the spiral spring coil 850 will keep the PFO closed as the tissue heals. The tissue healing around the wire 850 will help secure it to the tissue and prevent embolization.

[0091.7] In another embodiment, a patch might also be used on the right atrial side to provide an additional means to seal the PFO. If it is desirable to prevent the wire around the patch area from receiving RF energy, it is possible to electrically insulate the portion of the wire that is not desired to burn into the tissue (not shown). In another embodiment, the "zig zag" portion 852 of the coil 850 located in the flattened passageway between the primum and secundum might have sharp features (such as needles or barbs) which cause the adjacent surfaces of the primum and secundum to bleed and heal together. RF energy might be used in any of the embodiments of the spiral spring coil described above to burn some or all of the device into the tissue and promote rapid healing and prevent embolization.